Electronic Version
Stylesheet Version v1.1.1

# Description

# [Clean Air Toilet System-Tank "C.A.T.S -Tank"]

## BACKGROUND OF INVENTION

### [THE FIELD OF INVENTION]

[0001] The field of inventive concept is: Mechanical Ventilation with application in the home and public bathrooms

### [DESCRIPTION OF RELATED ART]

[0002] At the present the Mechanical Ventilation System for bathrooms requires: *a).*An Exhaust System (an Exhaust Fan above ceiling) *b)* An Air Supply System to compensate for the air exhausted in the ventilation process

[0003] As per Mechanical Code, each bathroom without natural ventilation (no exterior windows) needs to be provided with a Mechanical Ventilation System. A Mechanical Ventilation System is necessary to avoid the formation of mold, reduce the fog formation, as well as to remove odor and to improve indoor air quality.

[0004] *Inefficient.* The present Mechanical Ventilation System requires longer period of time to work, in order to accomplish the following tasks: *a)* Avoid formation of mold *b)* Reduce steam *c)* Improve indoor air quality. The System commonly used today needs to stay "on" for a longer period of time in order to accomplish the desired result. This results in an increased use of electricity.

[0005] *Noisy.* The Exhaust Fan located above the ceiling is in direct contact with the bathroom walls, allowing related noise to travel through the wall system from the bathroom into the adjacent building spaces.

[0006] *Missing an appropriate air filter. a)* Without the protection of an air filter, the Exhaust Fan, located above the ceiling, will get clogged in a short period of time. *b)* The Odorous Air exhausted from the bathroom is expelled outside into the outdoor environment without a filtration system, which has a significant impact on the environmentally clean air.

[0007] *Unprotected indoor air quality.* Indoor air quality studies found that the air quality inside buildings is more polluted then outdoor air, even during severe air pollution events. The inefficiency of the standard Mechanical Ventilation

System greatly contributes to the unhealthy clean air inside buildings. As a direct result of these inefficiencies, the use of aerosol sprays and other expensive products are needed to cover up odors. The use of such room deodorants and other similar products are affecting indoor and outdoor clean air quality.

[0008] *Energy inefficiency.* The current Exhaust Ventilation System in bathrooms does not save electricity because it needs to be "on" a longer period of time to accomplish its function

## SUMMARY OF INVENTION

[0009] The proposed Clean Air Toilet System Tank or "C.A.T.S – Tank" is a standard toilet tank with a dual function: *a)*To hold water for flushing the toilet bowl( Standard function) *b)*To exhaust and carry out odorous air directly from the toilet bowl using the existing Exhaust System. This is a novel and unique function.

[0010] The C.A.T.S – Tank comprising: *(1)* Air Grille and Odor Filter (novel). *(2)* Odor Air Duct (novel) *(3)* C.A.T.S–Tank Water Container *(4)* C.A.T.S –Tank two back openings (novel) *(5)* C.A.T.S –Tank lid (standard) *(6)* Odor Air Tight Insulation (novel)

## [ESSENCE OF INVENTIVE CONCEPT]

[0011] This new type of toilet tank requires a minimum investment and helps to resolve one of today's most important demands with regards to private and public restrooms. The unique features and benefits of the C.A.T.S-Tank are as follows:: *a)* Provides an environmental solution to the emission of polluted air. *b)* Improve indoor air quality. *c)* Significantly reduces noise created by the standard Mechanical Ventilation System. *d)* Is energy efficient ( save electricity and water) *e)* To improve overall quality of living.

**[HOW SOLVE THE CURRENT DEMANDS]**

[0012] The current demands are: *a)* To find an environmental solution to the emission of polluted air. *b)* To improve indoor air quality. *c)* To reduce the noise from the bathroom Mechanical Ventilation System. *d)* To save energy (electricity and water). *e)* To improve the quality of living. The proposed C.A.T.S.-Tank addresses and provides solutions to all of the above demands

**[ADVANTAGES OF THE CLEAN AIR TOILET SYSTEM-TANK "C.A.T.S -TANK ]**

[0013] The C.A.T.S-Tank is a perfect solution to:

[0014] *1. Improves indoor air quality* Adding a second place for ex-

hausting the polluted air, at the Toilet Tank level, C.A.T.S -Tank offers an improved solution to the existing system

[0015] *2. Saves electricity* By working a shorter time, the C.A.T.S-Tank uses less electricity than the standard bathroom Mechanical Ventilation System, accomplishing better results for less cost.

[0016] *3. Saves water* The C.A.T.S -Tank Odor Air Duct located inside the tank, reduces the volume of water, which results in saving the amount of water used per each flush.

[0017] *4. Protects the environment* The unique Odor Filter, improves the quality of the exhausted air delivered outside and into the environment.

[0018] *5. Improves the efficiency of the existing bathroom Mechanical Ventilation System.* Using a second location to exhaust bathroom air, at the Tank level, results in the improved efficiency of overall ventilation Additionally, the Air Grille is located closer to the odor emission place than the standard bathroom exhaust system.

[0019] *6. Works automatically, easy to use, no moving parts and reduced noise.* The C.A.T.S -Tank starts working automatically when the wall electrical switch in turned "on" the bathroom.

[0020] *7. Very inexpensive* The C.A.T.S.-Tank uses the existing bathroom features such as: *a)* existing toilet water tank *b)*

Existing toilet bowl *c)* existing Mechanical Ventilation and Electrical System The cost of C.A.T.S –Tank including the Odor Grille and Odor Filter is a minimal investment.

## Brief Description of Drawings

[0021] *Fig1* A three dimensional view of C.A.T.S –Tank – Not to Scale – Toilet Bowl and Toilet seat (dotted line is not part of the claim)

[0022] *Fig2* The C.A.T.S.–Tank Plan –Scale 1/4=1– At the A /A Level (dotted line is not part of the claim)

[0023] *Fig3* C.A.T.S–Tank Front View

[0024] *Fig 4* C A.T.S–Tank Section –Scale1/4=1 At the B /B Level See Fig(2)

[0025] *Fig 5* C.A.T.S.–Tank Back View No.(4) indicates two places of connection with the existing Ventilation System

[0026] *Fig6* C.A.T.S–Tank Assembly

## Brief Description of Sequences

[0027] Sequences are: *(1)* Air Grille and Odor Filter *(2)* Odor Air Duct *(3)* C.A.T.S–Tank Water Container *(4)* Back C.A.T.S – Tank Openings (two) *(5)* C.A.T.S –Tank Lid *(6)* Odor Air Tight Insulation *(7)* Toilet Seat *(8)* Toilet Bowl *(9)* Existing Duct from Exhaust Fan above bathroom ceiling *(10)* Water Tank Drain *(11)* Cold Water Supply *(12)* Bathroom wall *(13)*

Exhaust Fan above ceiling *(14)* Ceiling Exhaust Air Grille *(15)*Flow Direction *(16)*To the exterior environment. *(17)* Odor Air Flow

## Detailed Description

[0028] *(1) Air Grille and Odor Filter* Element (1) is located in front bottom of the C.A.T.S-Tank. The Air Grille and Odor Filter are built together in one element and are designed to: *a)*Exhaust the Odorous Air from the Toilet Bowl, before the odor spreads inside the bathroom. *b)*Clean the Odorous Air before it is released into the exterior environment. *c)* Protect the C.A.T.S-Tank from clogging. A large selection of materials are currently available for use: Sheet metal, ceramic, plastic, glass, rubber, wood or any other water proof materials which are easy to clean and quite strong. Air Filter is membrane type ( nylon having micron sized holes)

[0029] *Size:* 100mm. wide/20mm. height; Filter size: 100mm. wide/60mm. height The distance between the Air Grille and the Odor Filter will vary depending on the toilet bowl and the toilet seat type. The Air Grille and Odor Filter may need to be replaced every 6 month. Air Grille and Odor Filter is a novel element with an unique function and location. The connection between element(1) and the

C.A.T.S.-Tank Container(3) is similar to a vacuum cleaner hose

[0030] *(2) Odor Air Duct* The Odor Air Duct is located inside the C.A.T.S-Tank and is immersed in the water. The duct encircles the 3 sides of the C.A.T.S-Tank. The wall of the Odor Air Duct's water proof. The functions of the Odor Air Duct are: *a)* To create a passage for the Odorous Air through the C.A.T.S-Tank. *b)* To make a connection between the Odor Air Grille and the bathroom Exhaust Fan located above ceiling. *c)* To reduce water tank capacity. Materials used for the Odor Air Duct are ceramic, cast iron, glass or any water proof material with the required strength. The Odor Air Duct built inside the C.A.T.S-Tank is a novel concept, with a unique location and function.

[0031] *Size:* 80mm. wide/60mm. height ( or equivalent diameter.) The duct size has to be adequate to the function of circulating and carrying out odorous air into the Exhaust System, and from there further into the exterior environment

[0032] *(3) C.A.T.S.-Tank Water Container* The C.A.T.S -Tank Water Container is a standard toilet water tank designed to hold the necessary water to flush in the toilet bowl. The C.A.T.S-Tank Water Container capacity is less than a standard tank. The Odor Air Duct placed inside the

C.A.T.S-Tank will reduce the water quantity. Materials used for the C.A.T.S-Tank Water Container wall are: ceramic, cast iron, glass or any water proof material with the required strength.

[0033] *(4) Back C.A.T.S-Tank Openings(two)* There are two Openings to accessing into the C.A.T.S-Tank. The function of the tank openings is to connect the C.A.T.S-Tank with the existing exhaust ducts (two) from the Exhaust Fan above the ceiling. The size of each opening is 50mm. in diameter.

[0034] *(5) C.A.T.S-Tank Lid* This is the standard toilet tank lid.

[0035] *(6) Odor Air Tight Insulation* The Odor Air Tight Insulation is a Rubber Foam Weather Seal Self Stick Tape placed under the toilet seat around the edge, between the toilet bowl rim and the toilet seat. The insulation functions are: *a)* To stop the Odor from the toilet bowl from spreading into the bathroom. *b)* To direct the Odorous Air inside the bowl to the back, where the Exhaust Grille is located. The size of the tape is 20mm. wide and 10mm. thick.